

Benjamin Bloom: All Students Can Learn

Paul M. Geldston

North Carolina State University

Table of Contents

• Preface	3
• Benjamin Bloom's Educational Research (Expository Prose)	4
• Before and After Bloom (Cartoon)	9
• Bloom's Taxonomy Computer Program (B.A.S.I.C. Code)	10
• Lesson Objectives Using Bloom's Taxonomy (Graphic Organizer)	13
• Just Another Level of Bloom (Song Lyrics)	14
• Blooming Kids (Play)	15
• Works Cited	19

Preface

As the field of teaching continues to evolve, a number of educational researchers and behavioral psychologists have had a tremendous impact on both attitudes and practices employed by teaching professionals all over the world. Benjamin Bloom's work sits comfortably amidst the work of giants like Piaget, Vygotsky and Gardner, and once explored, it's easy to understand why. Bloom's work was far reaching, and multi-faceted. While the now-famous pyramid of "Bloom's Taxonomy" is ubiquitous in educational circles, Bloom was also responsible for further developing John Carroll's concepts of "mastery learning," and his research "provided the intellectual and empirical basis for Head Start" (Honan, 1999), as well as the establishment of several international educational research groups and associations. But perhaps Benjamin Bloom's greatest contribution to education, and humanity in general, was the sheer optimism embodied in his work. In his time, he challenged some long-held notions of student aptitude, and in doing so, gave teachers around the world a new way of looking at their students. All students can learn. That is the unifying message of Benjamin's research, and the message this paper seeks to impart to the reader.



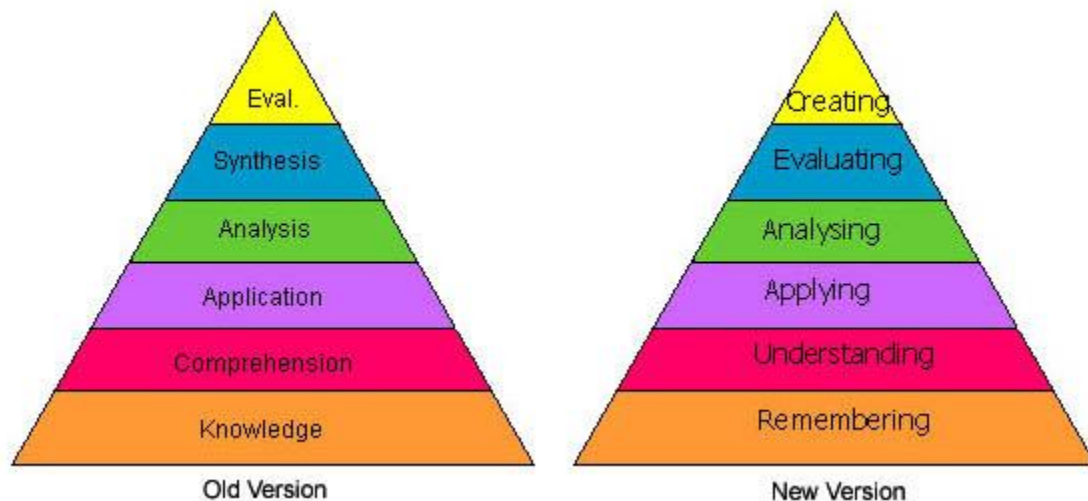
Benjamin Bloom's Educational Research

Benjamin Bloom, by all accounts, wasn't a large man, but he must've had a big heart within his diminutive form. In 1987, in response to another researcher, Bloom wrote, "'It is a crime against mankind to deprive children of successful learning when it is possible for virtually all to learn to a high level.'" That statement sums up Bloom's work, and the legacy left by his work since he passed away in 1999. Bloom was a distinguished professor of Education at the University of Chicago, and also helped form several international research bodies, including the International Association for the Assessment of Educational Achievement (IEA). One of Bloom's students, Eliot W. Eisner, described in a short biographical piece how Bloom used hands-on coin tossing with his graduate students to explore probability, as opposed to merely lecturing (p.1). For Benjamin Bloom, a teacher's job, even at the highest academic levels, was more than simply standing in front of people and talking, and he carried those beliefs into his own classroom at the University of Chicago. As Eisner wrote, "he was in love with the process of finding out, and finding out is what I think he did best. (p.2)"

In 1972, Bloom wrote an article for *The School Review* called "Innocence in Education," in which he described some of the mythologies surrounding education at the time, and perhaps even in some circles to this day. These included notions of limited aptitude, often supported by test scores. Such notions basically enforced an expectation of failure, with some schools experiencing failure rates as high as 75% (p.5). Not only did Bloom believe these notions were inaccurate, but also harmful, resulting in "emotional illness" for untold numbers of students which could affect them into adulthood. Bloom hoped to see such detrimental notions replaced as the field of educational research progressed, and essentially posited the idea that teaching

methods were the problem, not some hereditary, social, or behavioral limitation of students. He would spend his entire career researching such methods.

Many students of education are introduced to Bloom in relation to his taxonomy, and in particular, the following chart (Forehand, 2010):



These now-famous charts illustrate the levels of cognition used in learning in hierarchical order.

Rote memorization sits at the bottom, moving through various levels, and peaking with creativity. It's ironic to note how education is so often dominated by the lowest level of cognition. "Schools, teachers, and textbooks are apparently directed toward filling a presumably "empty head" with things to be remembered," was Bloom's lamentation in 1972 (p.10).

Understanding involves comprehension, demonstrated by cognitive activities like summarization, interpretation and prediction. Applying involves using information and understanding to actually do something, demonstrated by classification, construction and experimentation. Analyzing involves the process of deconstruction of information to obtain an understanding of its component parts, and how it all fits together. Analytical cognitive taxonomy would include ordering, explaining and differentiating. Evaluating involves a personalized

process of judgment based on all that is now known and understood, demonstrated by cognitive acts of ranking, assessing and forming conclusions. And finally, creating is the act of combining all the other cognitive components to reorganize elements in new and unique structural compositions. Taxonomy at this highest cognitive level would include composing, planning and combining (Forehand, 2010).

Beyond taxonomy, Bloom also spent a great deal of time researching and championing mastery learning. Conventional learning methods generally involve teachers lecturing, and/or otherwise conducting class for some weeks, followed by tests which would result in some particular grade. At that point, the class would move onto the next set of lessons. The inevitable result would be a bell curve, with some students doing well, most doing average, and the remainder failing. In 1984, Bloom published a research paper called "The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring" in *The Educational Researcher*, in which he describes methods for classrooms to achieve results closer to those seen in one-to-one tutoring situations using a technique called mastery learning.

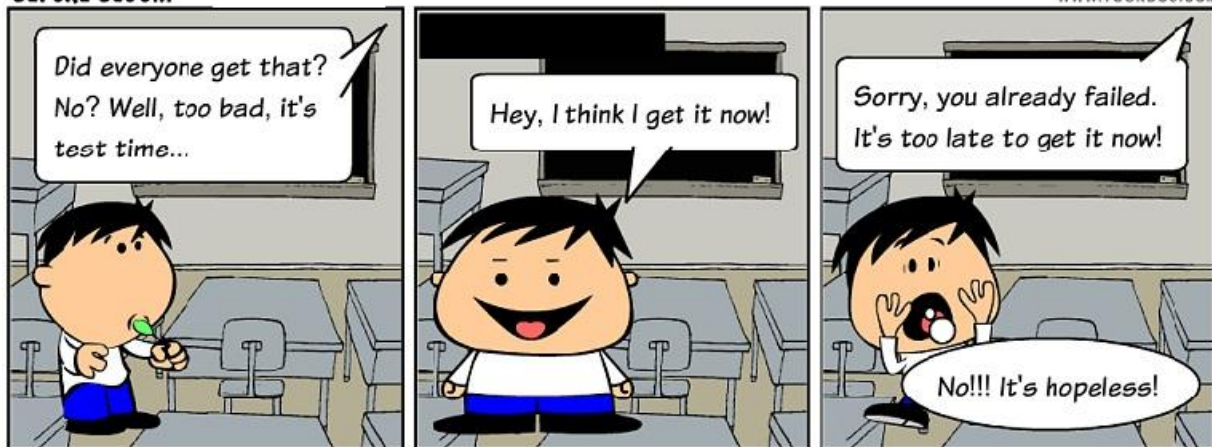
Bloom compared the two methodologies in the following manner: "Teaching under Mastery Learning and under Conventional Instruction is much the same except for the Mastery Learning feedback-corrective process every 2 or 3 weeks in which a formative test is given to students, followed by corrective instruction, and then by a parallel formative test.(Bloom, 1984, p.507)" The numbers revealed in the 2 Sigma study are remarkable: about 20% of students achieved in conventional learning environments, 90% of students in one-one tutoring, and 70% to 80% in mastery learning. While most real world classrooms can't realistically provide one-to-one tutoring for every student, mastery learning could be an effective tool in closing the tremendous educational gap left under conventional methods. Beyond that, studies have also

shown a “multiplier effect” under mastery learning, which results in improved attendance, classroom participation and more positive attitudes toward school and learning (Gurskey, 2001, p.18) Furthermore, mastery learning studies support Bloom’s assertion that “under appropriate learning conditions, students differ in the rate at which they can learn - not in the level to which they can achieve or in their basic capacity to learn (Bloom, 1972, p.6).”

There was a powerful humanitarian consciousness that pervaded Bloom’s work, generously supported by rigorous research. In 1980 he published a paper called “The New Direction in Educational Research: Alterable Variables” in *The Journal of Negro Education*, in which he once again holds archaic, and ultimately socially damaging, notions of aptitude and learning up to the light. He sought to discover “learning conditions that can bring about equality of educational outcomes,” and examined what variables might exist beyond the flawed single student aptitude variable stubbornly used by conventional learning methods. Altogether there were five variables presented as oppositional concepts, which included: (1) time vs. time-on-task, (2) intelligence vs. cognitive entry, (3) summative vs. formative testing, (4) teachers vs. teaching and (5) parent status vs. home environment. In greatly simplified terms, Bloom examined these variables to reinforce the idea that all students can learn and master material, given enough time and proper preparation. Furthermore, he explained that testing should not be a punishing process, that oftentimes sent students with difficult home situations into spirals of failure at school, but a tool used in an uplifting diagnostic and corrective process. Finally, in regards to teachers, he found that individual teachers traits and practices had little impact on learning, while teaching methods and procedures had tremendous impact when properly implemented.

In conclusion, Benjamin Bloom's contribution to the field of educational research was expansive, and his ideas have given many professional teachers and educators around the world food for thought and reflection. His work represents not only an honest, practical, scientific look at educational methods, but perhaps more importantly, it represents a source of hope and optimism for the future of education and humanity, amidst an often dauntingly pessimistic world.

Before and After Bloom: Conventional Vs. Mastery Learning

BEFORE BLOOM**AFTER BLOOM**

Bloom's Taxonomy Computer Program

NOTE: this code was written & tested using QBASIC running under DOSBOX under Windows 7)

Disclaimer: this is very, very bad coding! I haven't written a program in over a decade!

```
REM Bloom's Taxonomy BASIC Program by Paul M. Geldston

CLS

PRINT

PRINT "WELCOME!"

PRINT

COLOR 5, 0

PRINT "This is an attempt at writing a very simple computer
program"

PRINT "that demonstrates some ideas from Bloom's taxonomy."

COLOR 7, 0

PRINT

INPUT "PRESS ENTER TO CONTINUE", a$

CLS

PRINT "Great, let's begin by telling me a few things about
yourself."

PRINT

PRINT

COLOR 4, 0

PRINT "BLOOM's Taxonomy Level 1: REMEMBERING"

PRINT

PRINT "Let me memorize a few things about you..."

PRINT

COLOR 7, 0

INPUT "What is your name. "; name$

INPUT "What is your favorite food. "; food$

INPUT "What is your favorite place. "; place$

PRINT

PRINT "Got it! Your name is "; name$; ", you like to eat "; food$; ",
and you like to be (at the/your/etc.) "; place$; "!"

PRINT

COLOR 6, 0

PRINT "I have achieved level 1 - Remembering!!! Let's go on
now..."

COLOR 7, 0

PRINT

INPUT "PRESS ENTER TO CONTINUE", a$

CLS

PRINT

PRINT

COLOR 4, 0

PRINT "BLOOM's Taxonomy Level 2: Understanding "

PRINT

COLOR 7, 0

PRINT "Let me see if I understand something. "; name$; "..."

PRINT

PRINT "From what I know, I think you might like to eat "; food$; "
at "; place$; "?"
```

```
PRINT
```

```
PRINT "But I wonder if that's true... hmm..."
```

```
PRINT
```

```
COLOR 6, 0
```

```
PRINT "I have achieved level 2 - Understanding! Let's go on  
now..."
```

```
COLOR 7, 0
```

```
PRINT
```

```
INPUT "PRESS ENTER TO CONTINUE", a$
```

```
CLS
```

```
PRINT
```

```
COLOR 4, 0
```

```
PRINT "BLOOM's Taxonomy Level 3: Applying"
```

```
PRINT
```

```
COLOR 7, 0
```

```
PRINT "Was I right before? Do you eat "; food$; " at (the/your/etc.)  
"; place$; "?"
```

```
PRINT
```

```
INPUT "Type Y for yes, or N for no, then press ENTER", reply$
```

```
PRINT
```

```
IF reply$ = "y" THEN PRINT "Interesting, so it's OK to eat when  
you're (at the) "; place$; "!"
```

```
IF reply$ = "n" THEN PRINT "I see. So it's not a place to eat!"
```

```
COLOR 6, 0
```

```
PRINT
```

```
PRINT "I have achieved level 3 - Applying! Let's go on now..."
```

```
COLOR 7, 0
```

```
PRINT
```

```
INPUT "PRESS ENTER TO CONTINUE", a$
```

```
CLS
```

```
PRINT
```

```
COLOR 4, 0
```

```
PRINT "BLOOM's Taxonomy Level 4: Analyzing"
```

```
PRINT
```

```
COLOR 7, 0
```

```
IF reply$ = "y" THEN PRINT "After analyzing what I've learned, I  
would like to eat "; food$; " at (the/your/etc.) "; place$; " too!"
```

```
PRINT
```

```
IF reply$ = "n" THEN PRINT "Well, I don't agree! I'm not human, so  
I can eat "; food$; " at (the/your/etc.) "; place$; " and nobody would  
care!"
```

```
PRINT
```

```
PRINT "Of course, that's just my analysis of the situation. :-)"
```

```
COLOR 6, 0
```

```
PRINT
```

```
PRINT "I have achieved level 4 - Analyzing! Let's go on now..."
```

```
COLOR 7, 0
```

```
PRINT
```

```
INPUT "PRESS ENTER TO CONTINUE", a$
```

```
CLS
```

```
PRINT
```

```
COLOR 4, 0
```

```
PRINT "BLOOM's Taxonomy Level 5: Evaluating"
```

```
PRINT
```

```
COLOR 7, 0
```

```
IF reply$ = "y" THEN PRINT "From all that I've learned and  
analyzed, I think "; food$; " is delicious to eat and "; place$; " is a  
great place to be!"
```

PRINT

IF reply\$ = "n" THEN PRINT "From what I've learned & analyzed, I think "; food\$; " is delicious to eat, but "; place\$; " isn't that great a place."

PRINT

PRINT "That's my evaluation of the situation!"

COLOR 6, 0

PRINT

PRINT "I have achieved level 4 - Analyzing! Let's go on now..."

COLOR 7, 0

PRINT

INPUT "PRESS ENTER TO CONTINUE", a\$

CLS

PRINT

COLOR 4, 0

PRINT "BLOOM's Taxonomy Level 6: Creativity"

PRINT

COLOR 7, 0

PRINT "And now I'd like to show you my creative side!"

PRINT

INPUT "Press ENTER to proceed..."; reply\$

FOR i = 1 TO 15

COLOR i, 0

BEEP

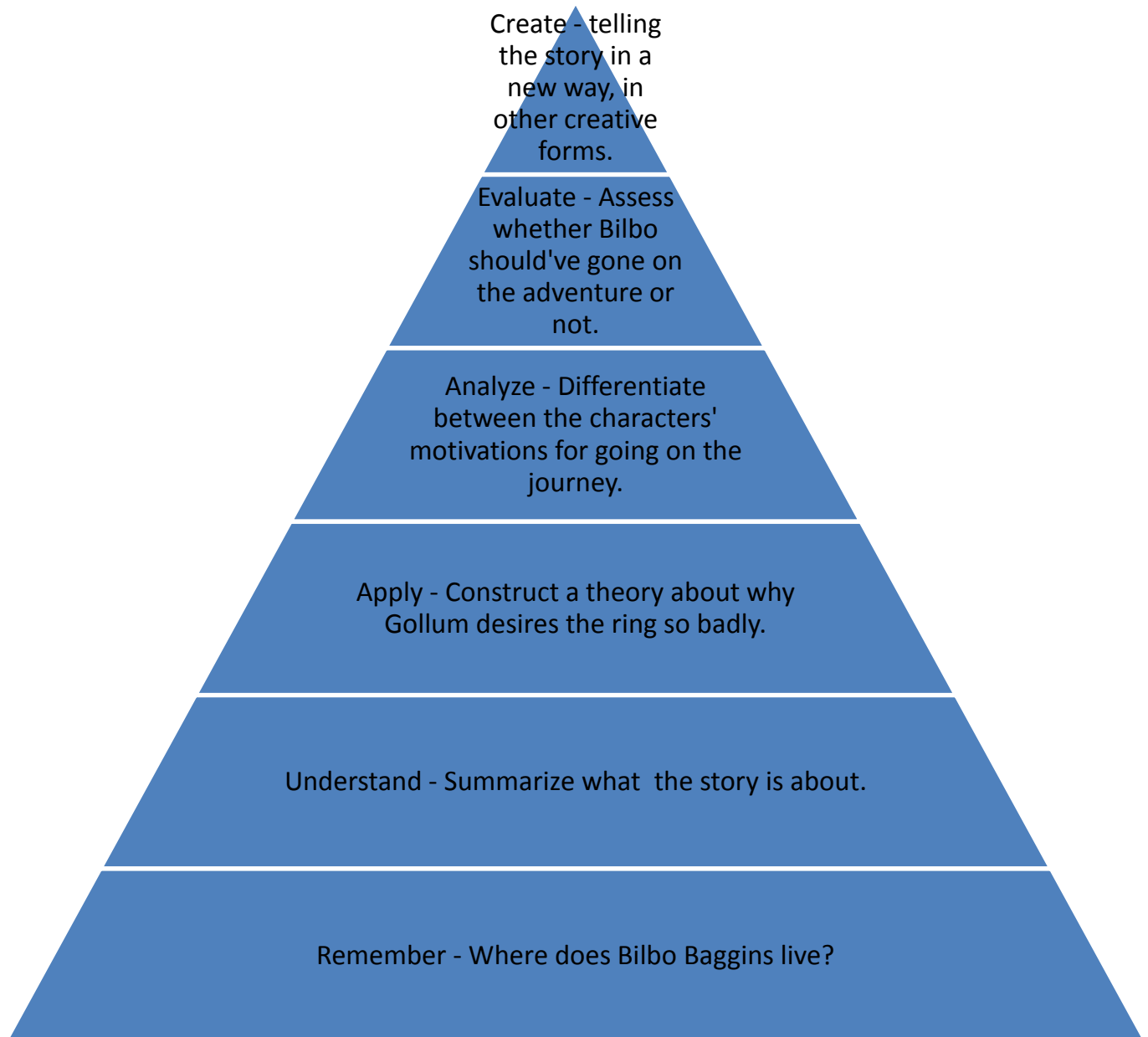
PRINT name\$, food\$, place\$

NEXT i

END

Lesson Objectives Using Bloom's Taxonomy

After reading the The Hobbit by J.R.R. Tolkien, here are some basic examples of how we might apply the various levels of cognition to studying the text:



(Forehand, 2010)

Just Another Level of Bloom

Pink Floyd's The Wall lyrics (1979) on the left, my Bloom influenced version on the right...

When we grew up and went to school	As we grow up and go to school
There were certain teachers who would	There needs to be teachers who would
Hurt the children anyway they could	Help the children anyway they could
By pouring their derisions	By using master learning
Upon anything we did	And full cognition
And exposing every weakness	And exposing every strength
However carefully hidden by the kids	Using feedback, correctives, and enrichment
But in the town it was well known	And in the schools it should be known
When they got home at night, their fat and	When they get home at night, their futures
Psychopathic wives would thrash them	Remarkably bright would make them
Within inches of their lives	Happy to live out their lives
We don't need no education	We do want some education
We don't need no thought control	We don't need to fail at school
No dark sarcasm in the classroom	No old notions in the classroom
Teachers leave the kids alone	Teachers help the kids along
Hey, teacher, leave the kids alone!	Hey, teacher, help the kids alone!
All in all it's just another brick in the wall	All in all it's just another level of Bloom

Blooming Kids

This is intended to be an attempt at a comedy skit in play form.

SETTING: A 6th grade middle school classroom with a blackboard, and filled with desks and chairs. The teacher, MR. HORNSTEIN, stands in front of the class, while his students, BILLY, SALLY and WALLY sit in the front row. BILLY is wearing preppie clothes and glasses. SALLY, who keeps falling asleep, is wearing jeans and a black Jonas Brothers T-shirt, and WALLY is wearing shorts, sneakers and a white T-Shirt with the Nintendo Wii logo.

MR. HORNSTEIN

OK class, I've finished grading your tests from yesterday, and I don't think you'll be surprised when you see your grades.

BILLY

Oh boy, Mr. Hornstein, did I get a hundred again?!

MR. HORNSTEIN

Yes, Billy! Good job! You memorized everything perfectly!

WALLY

Billy sucks!

MR. HORNSTEIN

Enough of that Wally! Let's talk about today's lesson.

(MR. HORNSTEIN begins writing furiously on the board while speaking gibberish.)

OK. Did everyone get that?

BILLY

Yes!

WALLY

No.

SALLY

(Wakes up momentarily...)

Whaaa...?

MR. HORNSTEIN

(Points to the right side of the board)

How about this section, did you all memorize it?

BILLY

Yes!

WALLY

No.

SALLY

What?

MR. HORNSTEIN

OK, take out a pencil. It's time for a quiz!

(Proceeds to hand out test papers, erases the blackboard,
and looks at his watch)

You have 5 minutes to answer these questions. Begin!

(The students work on the test, and after a few moments MR.
HORNSTEIN looks at his watch again)

And... stop! OK, put your pencils down.

(Collects the papers and quickly grades them at his desks)

The correct answers were A, A, B, B, C, A, D, A, B, A, C, E.

BILLY

Awesome, I got a hundred!

WALLY

You suck Billy!

SALLY

What?

(A new character, MR. BLOOM, suddenly bursts into the room, holding some books and a notepad)

MR. BLOOM

What are you doing to these children? All this memorizing! Don't you ever try to engage their higher levels of cognition?

MR. HORNSTEIN

What?

MR. BLOOM

(Places his hands on WALLY and SALLY'S shoulders...)

Just look at these poor kids! They must hate school. Why, you're just setting them up for failure. You're not giving them a chance to learn, and even when you do, you're boring them to death!

MR. HORNSTEIN

No!

MR. BLOOM

Stop playing innocent, Hornstein. You know better! And if you don't, then you should. There are all sorts of methods you can use to encourage every child to learn. Not just Billy, but Wally and Sally too. All students can learn! Now, aren't you ashamed of yourself?

MR. HORNSTEIN

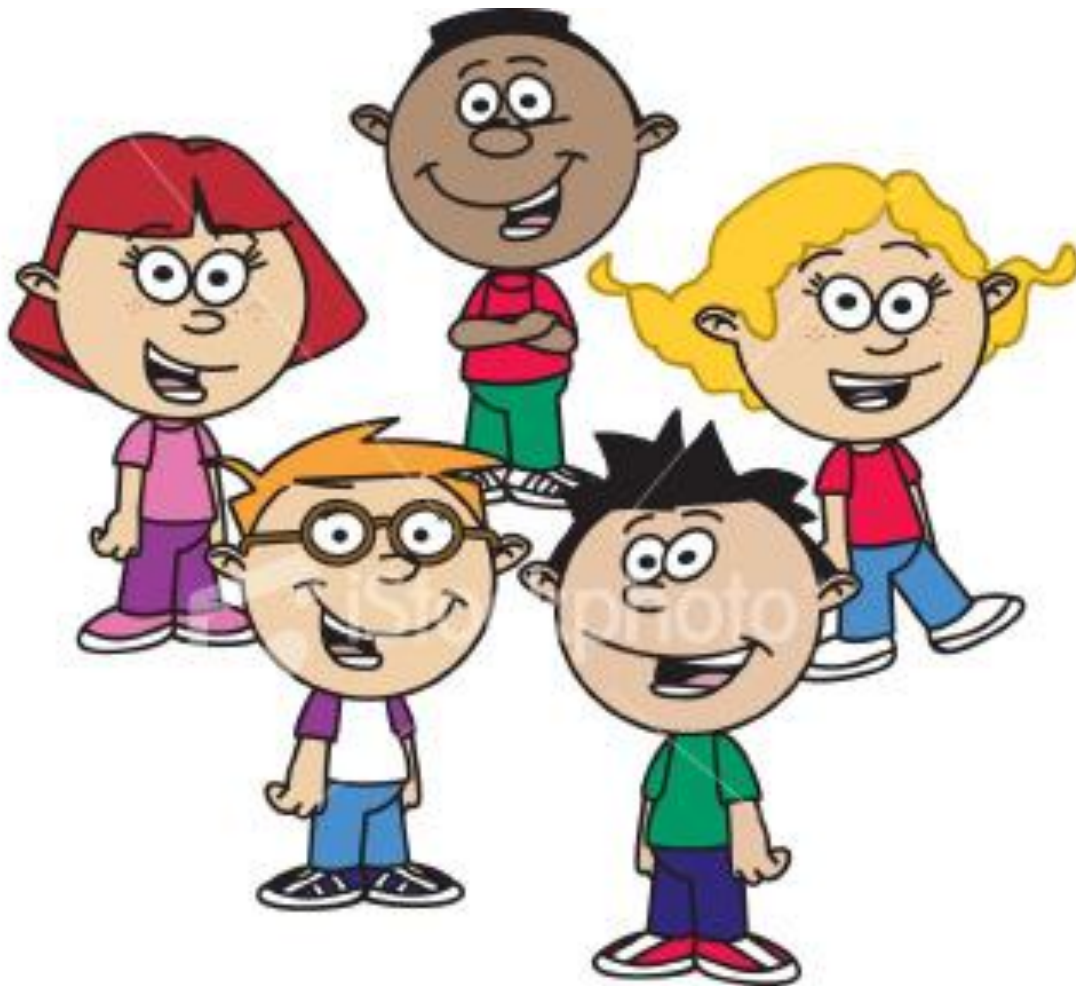
(Sighs)

Yes. Yes, you're right. I've been lazy. OK, I admit it. Kids, I'm sorry, and from now on I'll try harder. OK, what do you all have to say to that?

BILLY, WALLY and SALLY

You suck Mr. Hornstein!!!

THE END.



Works Cited

- Bloom, Benjamin S. (1972). Innocence In Education. *The School Review*, 80(3), 333-352.
- Bloom, Benjamin S. (1980). The New Direction in Educational Research: Alterable Variables. *The Journal of Negro Education*, 49(3), 337-349.
- Bloom, Benjamin S. (1984). The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to- One Tutoring. *Educational Researcher*, 13(6), 4-16.
- Bloom, Benjamin S. (1987). A Response to Slavin's Mastery Learning Reconsidered. *Review of Educational Research*, 57(4), 507-508.
- Eisner, Eliot W. (2000). Benjamin Bloom 1913-99. Retrieved February 17, 2010, from <http://www.ibe.unesco.org/publications/ThinkersPdf/bloome.pdf>
- Forehand, Mary. Bloom's Taxonomy. In *Emerging Perspective of Learning, Teaching, and Technology*. Retrieved February 17, 2010, from http://projects.coe.uga.edu/epltt/index.php?title=Bloom%27s_Taxonomy
- Gurskey, Thomas R. (2001). *Benjamin S. Bloom's Contributions to Curriculum, Instruction, and School Learning*. Retrieved from ERIC database. (ED457185)
- Honan, William H. (September 15, 1999). Benjamin Bloom, 86, a Leader In the Creation of Head Start. *The New York Times*. Retrieved from <http://www.nytimes.com>